Discussion of:
Benchmarking Money Manager Performance: Issues and Evidence

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Introduction

- CDL examine a number of issues related to performance evaluation:
  1. Time-series regression vs. characteristic matching.
  2. Dependent vs. independent sorts on size/value.
  3. Equal- vs. value-weighting within groups
  4. Which value measure should be used
  5. Annual vs. Quarterly
  6. B/M vs. Composite value measure
- One of the key messages in this paper is that differences in methodology result in “large” differences in measured performance.

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Discussion Plan

- This is well thought out, interesting and provocative piece.
  - There are a lot of interesting results here.
- I'm going to try to provide a really basic framework within which to understand CDL's empirical results.

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Performance Evaluation Theory – the RGP

- Start with a return generating process based on the client's information set:

$$\tilde{\mathbf{r}}_t = \mathbf{B}_{t-1}\tilde{\mathbf{F}}_t + \tilde{\epsilon}_t$$

where:

  - $\mathbf{r}_t$ is the N-vector of period t excess returns.
  - $\mathbf{B}_{t-1}$ is the matrix of factor-loadings at $t-1$
  - $\tilde{\mathbf{F}}_t$ is the time t excess return on a set of diversified *factor portfolios*.
  - $\tilde{\epsilon}_t$ is the vector of time t *residuals*,

and where:

$$\mathrm{E}_{t-1}[\tilde{\epsilon}_t] = 0, \quad \mathrm{E}_{t-1}[\tilde{\mathbf{F}}_t\tilde{\epsilon}_t'] = \mathbf{0}, \quad \mathrm{E}_{t-1}[\tilde{\epsilon}_t\tilde{\epsilon}_t'] = \mathbf{\Lambda} \text{ (Diagonal)}$$

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Optimal Passive Client Portfolio

$$\tilde{\mathbf{r}}_t = \mathbf{B}_{t-1}\tilde{\mathbf{F}}_t + \tilde{\epsilon}_t$$

- In this setting, the MV optimal (passive) unconstrained client portfolio will be a combination of the factor portfolios, with factor portfolio weights:

$$\mathbf{w}_{t-1} = \delta\boldsymbol{\Omega}^{-1}\boldsymbol{\lambda}$$

where $\boldsymbol{\Omega} = \mathrm{cov}_{t-1}(\tilde{\mathbf{F}}_t)$ and $\boldsymbol{\lambda} = E_{t-1}[\tilde{\mathbf{F}}_t]$.

  - These weights maximize the portfolio Sharpe Ratio.
- For example, given the Fama and French (1993)/Carhart (1997) model, the optimal portfolio would be a combination of the risk-free asset with the Market, HML, SMB, and UMD portfolios.

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Active Management

$$\tilde{r}_{p,t} = \alpha_{p,t-1} + \mathbf{B}_{p,t-1}\tilde{\mathbf{F}}_t + \tilde{\epsilon}_{p,t}$$

- Now consider an investment manager, who potentially has better information than the client.
- In this case the client will expect the manager to earn an additional *abnormal* return $\alpha_{p,t-1}$ on his/her managed portfolio (net of fees & expenses).
- If $\alpha_{t-1} > 0$, then the client portfolio can be improved by investing with this manager.
  - Based on the Treynor and Black (1973) logic, the amount allocated to the active manager should be proportional to:

$$\alpha_{p,t-1}/\sigma^2_{\epsilon,p}$$

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Sources of Alpha

- Within this framework, the manager will have a positive alpha if she adds value through:
  - Stock selection
  - Factor timing
  - Better understanding of factor structure.
- The manager will have a zero alpha if she uses:
  - Simple strategies (*e.g.*, size, value. momentum)
  - Leverage,
- and negative alpha if performance is less than fees and expenses.

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Estimating α

$$\tilde{r}_{p,t} = \alpha_{p,t-1} + \mathbf{B}_{p,t-1}\tilde{\mathbf{F}}_t + \tilde{\epsilon}_{p,t}$$

- A common misperception is that α here is the past fund performance, $\hat{\alpha}$
- α is rather the expected future performance of the fund, *based on all information* available to the client.
  - If performance persistence is low, expected future performance may be almost completely unrelated to past performance.
- If estimated past alpha is related to expected future alpha, then manager allocations should be related to $\hat{\alpha}$.

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Estimating Alpha

- This paper explores two basic methods for estimating fund performance:
  - Time series regression method
    - Carhart (1997)
  - Characteristic matching method
    - Daniel, Grinblatt, Titman, and Wermers (1997)

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$$\tilde{r}_{p,t} = \alpha_{p,t-1} + \mathbf{B}_{p,t-1}\tilde{\mathbf{F}}_t + \tilde{\epsilon}_{p,t}$$

- If:
  1. α_p and $\mathbf{B}_p$ are stationary, and
  2. a set of portfolios $\tilde{\mathbf{F}}_t$ span the MVE portfolio, based on the client's information.

  then $\hat{\alpha}_p$ can be estimated with a time-series regression:

$$\tilde{r}_{p,\tau} = \hat{\alpha}_p + \hat{\mathbf{B}}_p\tilde{\mathbf{F}}_\tau + \tilde{\epsilon}_{p,\tau}$$

  then the estimate of α_p is the regression intercept $\hat{\alpha}_p$.
- This method works well if:
  - you have high frequency data or long time series.
  - the regression R^2 is high.

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Characteristic-based analysis

- $\hat{\alpha}_p^C$ is defined as the mean of the weighted difference between each portfolio asset's return and the corresponding characteristics-matched portfolio return:

$$\hat{\alpha}_{p,t}^C = \tilde{r}_{p,t} - \underbrace{\hat{r}_{p,t}^C}_{=\left(\mathbf{B}_{p,t-1}\tilde{\mathbf{F}}_t\right)+\tilde{u}_t} + \tilde{\epsilon}_{p,t}$$

  - The underlying assumption is that two assets with the same set of characteristics will have essentially the same factor loadings.
- The characteristics method will work well if:
  - accurate, timely portfolio holdings data are available
  - there is a large cross section of assets
- A key issue is the size of the matched portfolio.

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Results

$$\tilde{r}_{p,\tau} = \hat{\alpha}_p + \hat{\mathbf{B}}_p \tilde{\mathbf{F}}_\tau + \tilde{\epsilon}_{p,\tau}$$

$$\hat{\alpha}^C_{p,t} = \tilde{r}_{p,t} - \underbrace{\hat{r}^C_{p,t}}_{=\left(\mathbf{B}_{p,t-1}\tilde{\mathbf{F}}_t\right)+\tilde{u}_t} + \tilde{\epsilon}_{p,t}$$

- The different approaches yield very different results.
- However, it doesn't appear that the differences are much different that one would expect.
  - This would be interesting to calibrate.
- The differences in tracking error volatility across measures are also (probably) consistent with what we would expect
  - Again, this would be interesting to calibrate.

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Why do we care?

- Expected α should be *the only* input into the client's hire/fire decision.
- Yet, CDL implicitly argue that clients pay too much attention to measured performance:
  - *"Failure to meet targets invites even more frequent monitoring from clients and consultants. To capture this short term orientation ..."*
  - *"Given the emphasis on performance, a few quarters of poor results can sour relations between a money manager and clients."*
  - *"In practice managers are hired and fired on the basis of performance over short horizons"*
- Clients should rationally use past performance information only to the extent is helps to forecast future performance.

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Performance Metric

- CDL don't examine whether any of these measures forecast future performance.
  - Instead CDL use the mean & median tracking error volatility and absolute return of the measures as performance metrics.
  - These are probably, but not necessarily, related to alpha forecast error.
- *Why not examine directly how well each of these measures forecast future alpha?*
  - For example, how well does a portfolio which is long high $\hat{\alpha}_p/\sigma_{\epsilon,p}$ fund do?
- Finally, how well would a combination of time-series and characteristics-approaches work?

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Other Data?

- Past performance is not the only observable instrument for future performance.
- Moreover, among mutual funds, Chevalier and Ellison (1999) find that there is *manager* persistence, not *fund* persistence.
  - Also, Chevalier and Ellison find that younger managers from a good undergraduate institution (with high composite SAT scores) perform better.
- Finally, it seems like many clients, acknowledging that past performance is noisy, use other data in forecasting future alpha:
  - Process characteristics
  - Team longetivity and characteristics.
- Unfortunately, little academic research has been done assessing the efficacy of these fund characteristics.

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Additional Issues

1. Why not control for momentum?
   - Numerous studies show that momentum is a key predictor of fund returns.
   - Controlling for momentum may fix some of the anomalous results.
     - *e.g.*, quarterly vs. annual value measures.
2. Additional Factors
   - Standard practice in time-series analysis is now to include only factors with a high premium:
     - *i.e.*, Mkt, SMB, HML, UMD
   - However, these factors do not do a good job of explaining the cross-section of realized returns (the covariance matrix)
   - Including industry factors, *etc.*, would increase the regression R^2, and hence reduce $\hat{\alpha}$ estimation error.

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